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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/754,277	01/05/2001	Takayoshi Sawayama	OKI.201	3046

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/754,277

Applicant(s)

SAWAYAMA, TAKAYOSHI

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2003 and 06 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 10-19 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 2 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/06/03 has been entered.

Claim Objections

Claim 19 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 19 recites that the second plasma is in the etching chamber. However, such limitation is already found in claim 14 at lines 9-10.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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Claims 10-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support in the specification, as originally filed, for either the first or second plasma detecting device measuring plasma as recited in each of independent claims 10 and 14.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art in view of Miyajima, U.S. Patent 5,885,352.

Admitted prior art shows the invention substantially as claimed including a parallel plate etching apparatus having electrodes 6,7 wherein the upper electrode 6 comprises a cooling plate 2 having a plurality of gas supply holes 3 for supplying the gas, a gas introducing plate 4 having gas holes 3 for introducing the gas into a

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processing chamber 9, and a jig 5 for fixing said gas introducing plate 4 (see Figure 1 and page 1-line 15 to page 2-line 3 of applicant's specification).

Admitted prior art lacks anticipation of a first plasma detecting device provided inside of said upper electrode between said gas-introducing plate and said cooling plate, wherein operation of said apparatus ceases if the pressure measured by said plasma device is below a predetermined level. Miyajima discloses using a detection unit including either photosensors 25 or mass flow sensors 15 to measure characteristics of the plasma, such as light emissions and pressure, inside an upper electrode 14 (see figs. 1, 4 and col. 2-line 45 to col. 7-line 28). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of the Admitted prior art so as to include the plasma detecting device of Miyajima between the cooling plate and the gas introducing plate of the admitted prior art because this will allow the operator of the apparatus to better understand when the apparatus needs to undergo routine maintenance.

With respect to the limitation "wherein operation of said parallel-plate dry-etching apparatus ceases if a pressure measured by said plasma detecting device is lower than a predetermined value" (claim 10) such limitations are directed to method limitations instead of apparatus limitations. Since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore do not patentably distinguish

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the claimed invention. The apparatus of the Admitted Prior Art modified by Miyajima is capable of being terminated upon reaching a predetermined pressure. Note that, as stated above, the process can be monitored and controlled by the plasma detecting device, and therefore, if desired by the operator, operation of the apparatus can be terminated at a predetermined pressure value as claimed.

Claims 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art in view of Miyajima, U.S. Patent 5,885,352 as applied to claims 10-12 above, and further in view of Loan et al., U.S. Patent 6,296,711 B1.

Admitted prior art and Miyajima are applied as above but fail to expressly disclose a second plasma detecting device, which measures a second pressure of a second plasma, provided within said dry etching apparatus in which a wafer is placed and a detector which measures a difference between the two pressures wherein, upon reaching a predetermined pressure differential, operation of the apparatus is terminated.

Loan et al. discloses an apparatus using pressure sensors 51 and 53 (see fig. 1B), whereby pressure sensor 51 is used to measure the pressure behind a gas introducing plate 72, and pressure sensor 53 is used to measure the pressure in the processing chamber (see col. 13-lines 62-67 and fig. 1B). Furthermore, the difference between pressure sensors 51 and 53 is determined as shown in Figure 5G, to control or monitor the process (see col. 15-lines 61-65). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate plasma detecting device that measures pressure behind the gas

introduction plate and in the chamber of the apparatus of the Admitted prior art modified by Miyajima, and incorporate means for determining the difference between the pressures detected by the pressure sensors because this will allow for greater controllability over the process (see col. 15-lines 64-65).

Additionally, it should be noted that Loan et al. discloses that pressure differential between the pressure sensors is measured and monitored (see col. 15, lines 61-65 and figs. 1B and 5G), which inherently will require a detecting means as claimed.

With respect to the claim limitation "upon reaching a predetermined pressure differential, operation of the apparatus is terminated" (claim 14), such limitations are directed to method limitations instead of apparatus limitations. Since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of the Admitted Prior Art modified by Miyajima, U.S. Patent 5,885,352 and Loan et al. is capable of being terminated upon reaching a predetermined pressure differential. Note that, as stated above, the process can be monitored and controlled by the pressure detecting means, and therefore, if desired by the operator, operation of the apparatus can be terminated at a predetermined pressure value or differential as claimed.

Concerning claim 16, note that the first plasma is at a backside of the gas introducing plate (see Miyajima, figs. 1 and 4).

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With respect to claims 13 and 17, note that although not explicitly stated, it would be inherent that the apparatus of Admitted prior art modified by Miyajima and further modified by Loan et al. would have a pressure increase as the gas holes of the gas plate increase.

Double Patenting

Applicant is advised that should claim 13 be found allowable, claim 17 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Response to Arguments

Applicant's arguments with respect to claims 10-19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Luz L. Alejandro
Primary Examiner
Art Unit 1763

December 15, 2003